PATENT
0941-0306P

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant: CHEN, Shun-An et al. Conf.: 1826

Appl. No.: 09/930,971 Group: 2863

Filed: August 17, 2001 Examiner: Xiuquin Sun

For: A SYSTEM FOR DYNAMICALLY MONITORING THE STABILITY OF SEMICONDUCTOR MANUFACTURING EQUIPMENT

LARGE ENTITY TRANSMITTAL FORM

Assistant Commissioner for Patents
Washington, DC 20231

April 17, 2003

Sir:

Transmitted herewith is a Request for Reconsideration in the above-identified application.

☐ The enclosed document is being transmitted via the Certificate of Mailing provisions of 37 C.F.R. § 1.8.

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The fee has been calculated as shown below:

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TOTAL	13	-	20	=	0	$18	$0.00
INDEPENDENT	1	-	3	=	0	$84	$0.00
☐ FIRST PRESENTATION OF A MULTIPLE DEPENDENT CLAIM						$280	$0.00
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☐ Please charge Deposit Account No. 02-2448 in the amount of $0.00. This form is submitted in triplicate.

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Respectfully submitted,

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Attachment(s)

(Rev. 10/15/02)

8/Recons. L. Walker 4-22-03

PATENT
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IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicant:	CHEN, Shun-An et al.	Conf.:	1826
Appl. No.:	09/930,971	Group:	2863
Filed:	August 17, 2001	Examiner:	Xiuquin Sun

For: A SYSTEM FOR DYNAMICALLY MONITORING THE STABILITY OF SEMICONDUCTOR MANUFACTURING EQUIPMENT

REQUEST FOR RECONSIDERATION

Assistant Commissioner for Patents
Washington, DC 20231
Sir:

April 17, 2003

Responsive to the January 17, 2003 Office Action, the following remarks are respectfully submitted in connection with the above-identified application.

REMARKS

Claims 1-13 are now present in this application.

A certified copy of the priority document was submitted on October 2, 2001. **Notification of receipt of the certified copy and acknowledgement of the claim for priority in the next action issued by the Examiner are respectfully requested.**

Claims 1-3 stand rejected under 35 USC 103 as being unpatentable over MCCOWN et al., U.S. Patent 5,067,099, in view of NARA et al., U.S. Patent 6,388,747. This rejection is respectfully traversed.

Claims 4-5 and 8-9 stand rejected under 35 USC 103 as being unpatentable over MCCOWN et al. in view of NARA et al. and further in view of LI, U.S. Patent 6,276,997. This rejection is respectfully traversed.

Claim 6 stands rejected under 35 USC 103 as being unpatentable over MCCOWN et al. in view of NARA et al., and further in view of SANDOVAL, U.S. Patent 6,345,259. This rejection is respectfully traversed.

Claim 7 stands rejected under 35 USC 103 as being unpatentable over MCCOWN et al. in view of NARA et al., and further in view of WEBSTER, U.S. Patent 5,505,090. This rejection is respectfully traversed.

Claim 10 stands rejected under 35 USC 103 as being unpatentable over MCCOWN et al. in view of NARA et al., and further in view of SCHMOLKE et al., U.S. Patent 6,333,785. This rejection is respectfully traversed.

Claim 11 stands rejected under 35 USC 103 as being unpatentable over MCCOWN et al. in view of NARA et al., and further in view of CHARLES, U.S. Patent 6,355,559. This rejection is respectfully traversed.

Claim 12 stands rejected under 35 USC 103 as being unpatentable over MCCOWN et al. in view of NARA et al., and further

in view of HINKLE, U.S. Patent 6,190,313. This rejection is respectfully traversed.

Claim 13 stands rejected under 35 USC 103 as being unpatentable over MCCOWN et al. in view of NARA et al., and further in view of JUSZKIEWICZ et al., U.S. Patent 6,353,169. This rejection is respectfully traversed.

It is respectfully submitted that neither MCCOWN et al. nor NARA et al. teaches, discloses or suggests a data processor analyzing inspection results to determine a second sampling rate.

The Examiner asserts that:

> "McCown et al. teach an apparatus and method for dynamically monitoring system performance comprising: a data processor analyzing the inspection results to determine a second sampling rate (col. 20, lines 27-52; col. 24, lines 53-68 and col. 25, lines 1-7)…"

Instead, as seen in col. 20, lines 27-52, col. 24, lines 53-68 and col. 25, lines 1-7, for example, MCCOWN et al. actually teaches:

> "The use of an event based representation to accomplish system performance monitoring and optimization in accordance with a preferred embodiment of the present invention will now be discussed with reference to FIG. 11. In the first step 500, operational data from sensors in the system being monitored is acquired by data acquisition circuitry during a period of operation of the system in much the same way as the data was acquired for fault diagnosis. It is preferable to use data acquisition circuitry having programmable parameters to allow for flexibility in the collection of the performance data. The following parameters, by way of example only, should be programmable; the enabling of the acquisition channels through which data is collected,

> the rate at which the data is sampled and the window of time over which the data is collected by the acquisition circuitry. Dynamically re-adjusting these and any other parameters provided by the acquisition circuitry according to the monitored performance of a system will yield collected data which is more pertinent to an aspect of the system performance which the monitoring system indicates needs further analysis. Such a flexible data acquisition system will, therefore, yield data of improved quality as well as a greater quantity of relevant data.", and
>
> "In addition to the channel configuration, the sampling rate at which the data acquisition system samples the signals in a system can be adjusted to examine a particular aspect of the data. FIG. 16 illustrates a signal 620 which is sampled on a particular channel. A first time line 622 illustrates the initial sampling rate of the data acquisition system, wherein samples of the signal are taken at times t.sub.1 and t.sub.3 and a voltage Level A is obtained each time. If the voltage Level A is a normal level, the sampling rate associated with time line 622 would not indicate the problem. If, however, the events recognized during the event recognition step 502 indicate that the problem may lie in this signal, then the sampling rate can be increased to obtain a more detailed picture of the signal and to examine any transient responses in the signal. For example, if the sample rate is doubled as indicated on time line 624, so that the signal 620 is now sampled at times t.sub.1, t.sub.2 and t.sub.3, then the sample taken at time t.sub.2 would indicate an abnormal voltage Level B which was undetected previously. Alternately, if the signal of concern needs to be sampled over a greater time window, the sampling rate of the system can be decreased."

From the quotation of MCCOWN et al. in the Office Action, it is taught that a rate at which data is sampled by detecting a signal output from a monitored system can be dynamically re-adjusted according to the monitored performance of the system. This, at most, implicitly teaches means for analyzing **the data**

sampled by detecting the signal from the monitored system to determine a new sampling rate. In col. 24, lines 53-68 and col. 25, lines 1-7, for example, MCCOWN et al. teaches the data being a voltage level A or B of the signal 620 output from the monitored system and the sampling rate being one at which the signal 620 is detected. However, in claim 1 of the present application, a data processor analyzes **the inspection results** to determine a second sampling rate. As described in page 4, lines 17-24 of the present application, the inspection results are thickness of an oxide layer or depths of etching of the wafers processed by the monitored manufacturing equipment. The sampling rate is one at which the wafers are inspected. Since voltage levels and a rate at which a signal is detected are intrinsically different from thickness of an oxide layer or depths of etching of the wafers and a rate at which the wafers are inspected, the data and sampling rate taught by MCCOWN et al. and claim 1 of the present application cannot be analogous to each other.

Further, one of ordinary skill in the art will appreciate that the data derived by and the sampling rate used for signal detection are intrinsically different from results derived by and sampling rate used for product inspection. Signal detection detects the voltage level or current magnitude on an node of a circuit or electrical system while product inspection inspects physical or chemical characteristics of a product processed by manufacturing equipment. It is unreasonable to allege the data and sampling rate taught by MCCOWN et al. as being analogous to the inspection

results and sampling rate taught by claim 1 of the present application.

Accordingly, MCCOWN et al. does not teach, disclose or suggest a data processor analyzing **inspection results** to determine a second **sampling rate.**

For this reason alone, claim 1 is neither taught nor suggested by the prior art utilized by the Examiner, and the 35 USC 103 rejection of claim 1 and its dependent claims should be reconsidered and withdrawn.

It is also respectfully submitted that neither MCCOWN et al. nor NARA et al. teaches, discloses or suggests a device storing the second sampling rate.

Since the sampling rate taught by MCCOWN et al. and claim 1 of the present application are intrinsically different, MCCOWN et al. does not teach a device storing the second sampling rate defined in claim 1 of the claimed invention.

Again, for this reason alone, claim 1 is neither taught nor suggested by the prior art utilized by the Examiner, and the 35 USC 103 rejection of claim 1 and its dependent claims should be reconsidered and withdrawn.

It is also respectfully submitted that neither MCCOWN et al. nor NARA et al. teaches, discloses or suggests a controller receiving the second sampling rate from the storage device and changing the first sampling rate of the inspection requested by the process executor to the second sampling rate.

The Examiner asserts that:

> "McCown et al. teach an apparatus and method for dynamically monitoring system performance

> comprising:...a controller receiving said second sampling rate from the storage device and changing said first sampling rate of the inspection requested by the process controller to said second sampling rate (col. Lines 27-52; col. 24, lines 53-68 and col. 25, lines 1-7)..."

First, the term "process controller" used by the Examiner is indefinite since it is used neither by MCCOWN Et al. nor in any claim of the present application. It is improper to associate "process controller" with any elements taught by MCCOWN or in the claims of the present application.

Second, the Office Action admits, in the third paragraph of section 2, that MCCOWN et al. does not mention a process executor. Accordingly, MCCOWN therefore does not mention a controller changing the sampling rate of the inspection requested by the **process executor.**

Third, since the data and sampling rate taught by MCCOWN et al. are intrinsically different from the inspection results and sampling rate taught by claim 1 of the present application, MCCOWN et al. does not teach a controller receiving the second sampling rate from the storage device and changing the first sampling rate of the inspection requested by the process executor to the second sampling rate.

For at least these reasons, claim 1 is neither taught nor suggested by the prior art utilized by the Examiner, and the 35 USC 103 rejection of claim 1 and its dependent claims should be reconsidered and withdrawn.

It is again noted that it would not be obvious to one of ordinary skill in the art at the time the invention was made to

include the teaching of the NARA et al. process executor in the MCCOWN et al. system, in order to automatically execute the parameter setting and data process in parallel with the inspection operation.

Although MCCOWN implicitly teaches means for analyzing the data sampled by detecting the signal from the monitored system to determine a new sampling rate, the data and sampling rate are intrinsically different from those taught by NARA et al. NARA et al.'s data and sampling rate are, respectively, defect information derived by inspecting wafers processed by a manufacturing equipment, and the rate at which the wafers are inspected. MCCOWN et al.'s data and sampling rate are, respectively, voltage levels derived by detecting a signal output from a monitored system, and the rate at which the signal is detected. Defect information and wafer inspection are irrelevant to voltage levels and signal detection. Further, the MCCOWN et al. system monitors a system generating an electric signal but absolutely not a manufacturing equipment processing wafers. Accordingly, there is no possibility and thus no motivation to include the teaching of the NARA et al. process executor in the MCCOWN et al. system.

For at least this reason, claim 1 is neither taught nor suggested by the prior art utilized by the Examiner, and the 35 USC 103 rejection of claim 1 and its dependent claims should be reconsidered and withdrawn.

It is also not obvious that the apparatus and method taught by MCCOWN et al. is broad enough and applicable to monitoring the stability of manufacturing equipment.

The Office Action states

> "It is also obvious that the apparatus and method taught by McCown et al. is broad enough and applicable to monitoring the stability of manufacturing equipment, because any manufacturing equipment can be treated as an individual instance or a part of the system taught by McCown et al., and the stability of the manufacturing equipment is simply one specific characteristics of the system performance under monitoring by the McCown apparatus and method."

As previously described, the MCCOWN et al. system only monitors a system generating an electric signal by deriving voltage levels detected from the signal at a rate which can be dynamically re-adjusted according to the performance of the monitored system. Those of ordinary skill in the art will appreciate that manufacturing equipment is an apparatus for processing products but absolutely not a system for generating an electric signal. It is unreasonable to allege any manufacturing equipment being an individual instance or a part of the system taught by MCCOWN et al. One of ordinary skill in the art will also appreciate that the stability of the manufacturing equipment is monitored by the inspection results of the products processed by the equipment but absolutely not by the voltage levels detected from a "signal" of the manufacturing equipment. It is unreasonable to allege the stability of the manufacturing equipment being simply one specific characteristics of the system performance under monitoring by the MCCOWN et al. apparatus and method. Accordingly, the apparatus and method taught by MCCOWN et al. are not broad enough and not applicable to monitoring the stability of manufacturing equipment.

For at least this reason, claim 1 is neither taught nor suggested by the prior art utilized by the Examiner, and the 35 USC

103 rejection of claim 1 and its dependent claims should be reconsidered and withdrawn.

For the reasons described above, it is respectfully submitted that the system for dynamically monitoring stability of manufacturing equipment disclosed in independent claim 1, as well as its dependent claims, is neither taught nor suggested by the prior art utilized by the Examiner. Accordingly, reconsideration and withdrawal of the 35 USC 103 rejections are respectfully requested.

Favorable reconsideration and an early Notice of Allowance are earnestly solicited.

In the event that any outstanding matters remain in this application, the Examiner is invited to contact the undersigned at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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